After Sales Technical Documentation

TROUBLESHOOTING INSTRUCTIONS FOR NHA–2 & NHA–4

Original, 43/96

NMP Part No. 0275035

AMENDMENT RECORD SHEET

Amendment Number	Date	Inserted By	Comments

TROUBLESHOOTING INSTRUCTIONS

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Introduction

General

The purpose is to define fault block of the module and then find out the broken component. The trouble shooting diagram has been planned so that the fault, whatever it is, can be found by as simple measurements as possible.

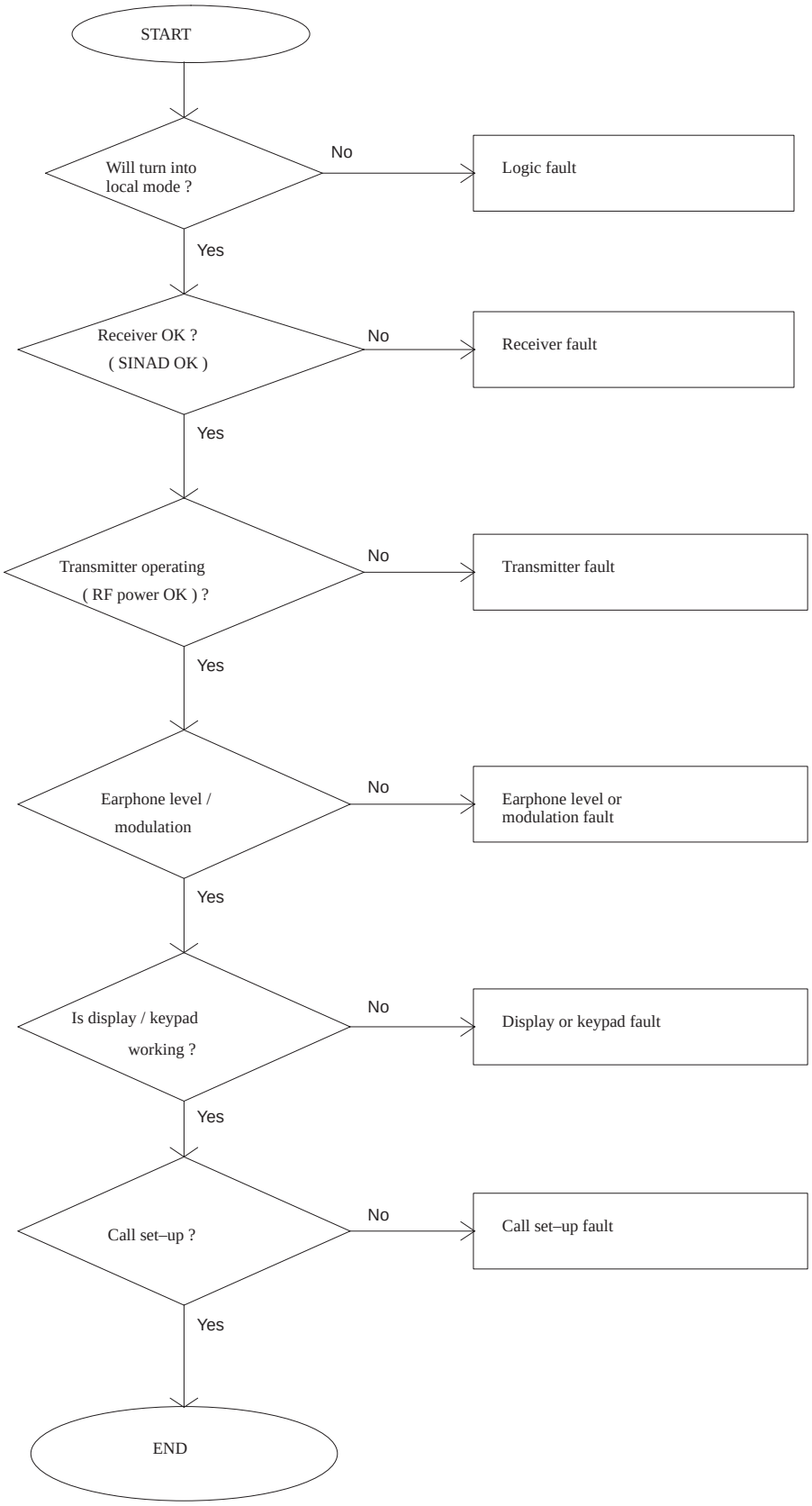
The flow diagrams give you the overview of the blocks. The purpose is that you proceed through the flow diagram so that, if your answer is YES for the asked question, go straight to the next level, but if your answer is NO, you have to go the subbranch.

Required servicing equipment:

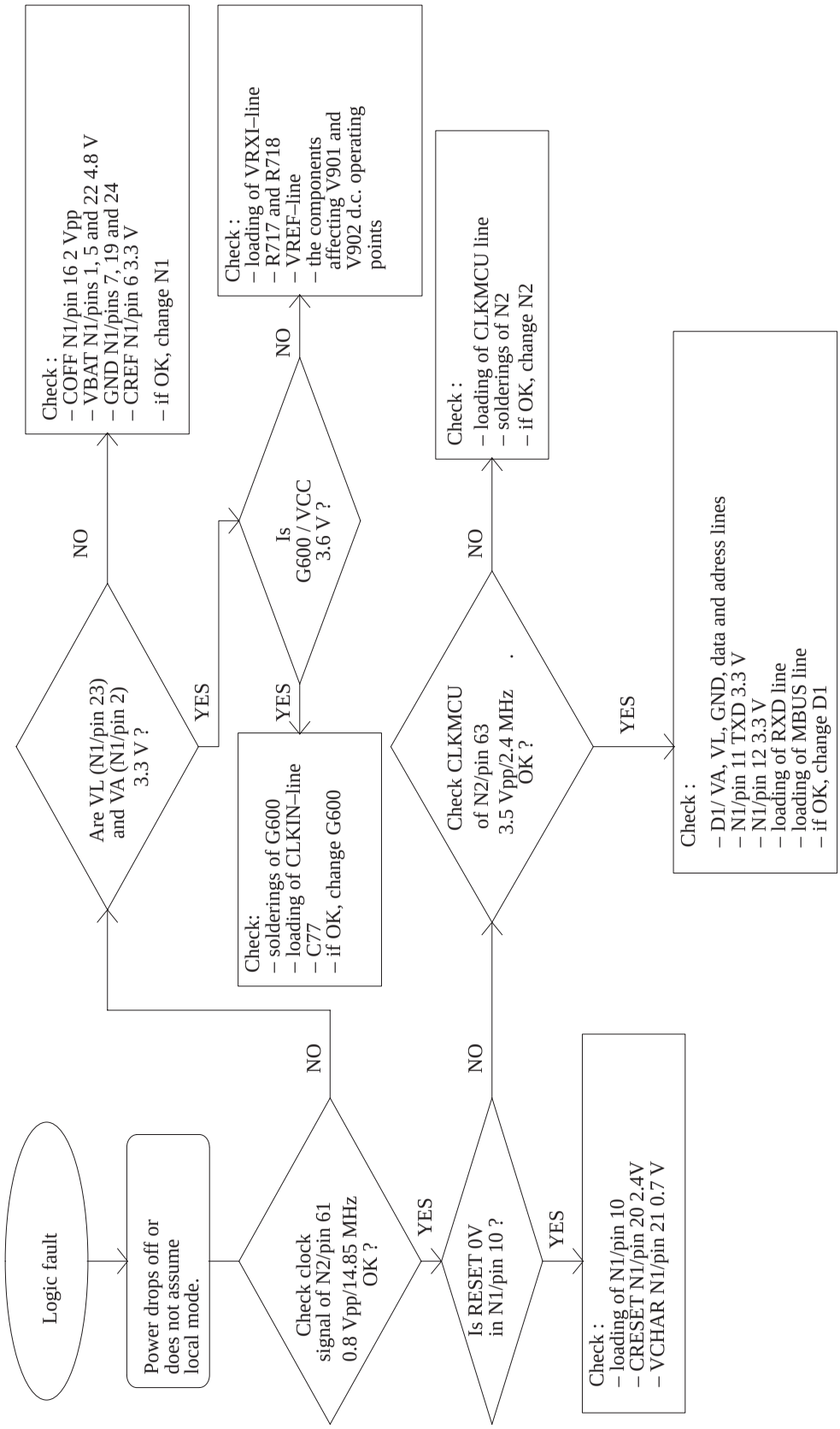
- PC for PC locals
- Power supply (2.0 A)
- Digital multimeter
- Oscilloscope
- RF cables
- Modular cable
- RS232/MBUS adapter
- CMT/Marconi
- RF measuring chassis

The Troubleshooting for NHA–2 consist of 8 consequent checks according to the following flow diagram.

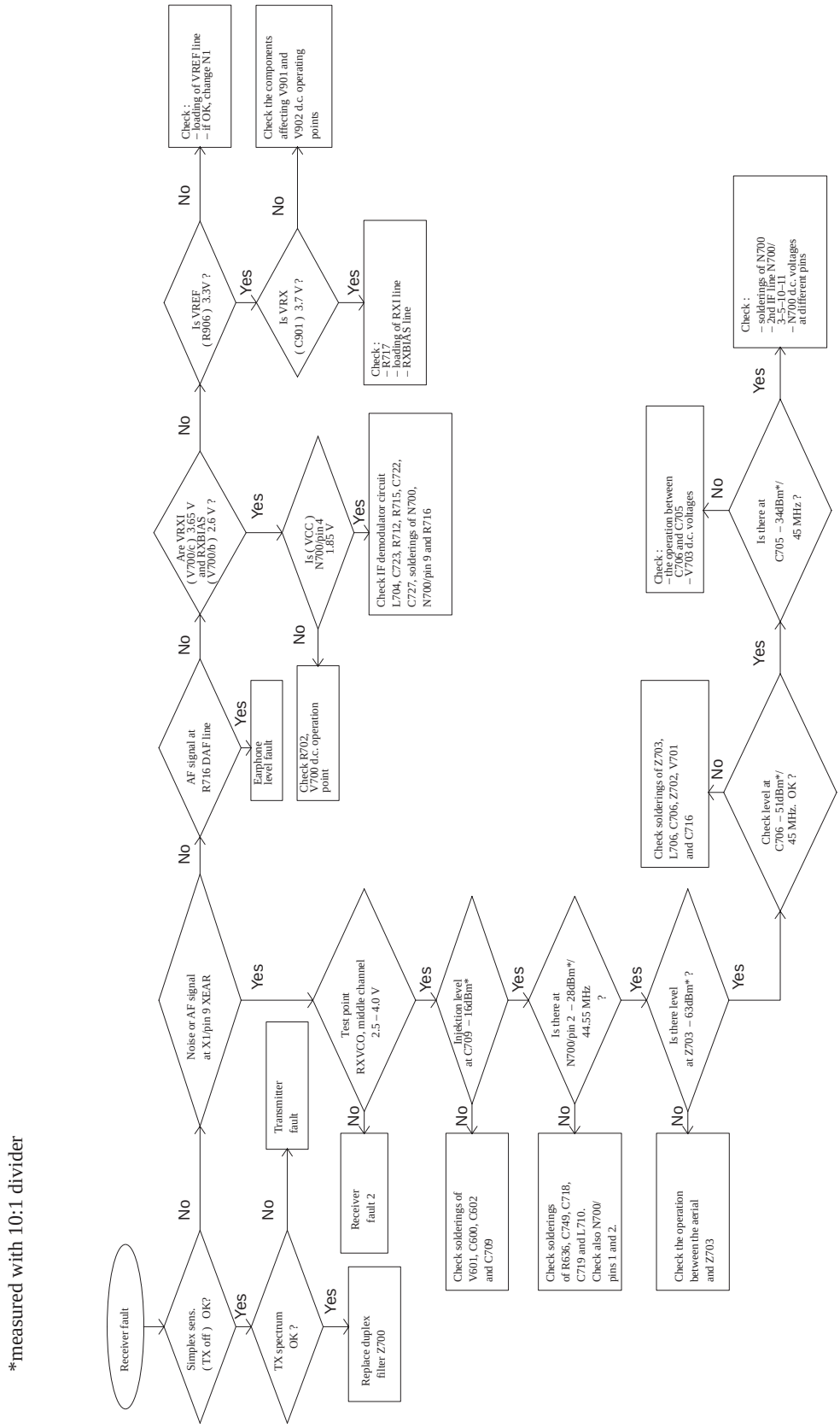
General Chart



Logic Fault

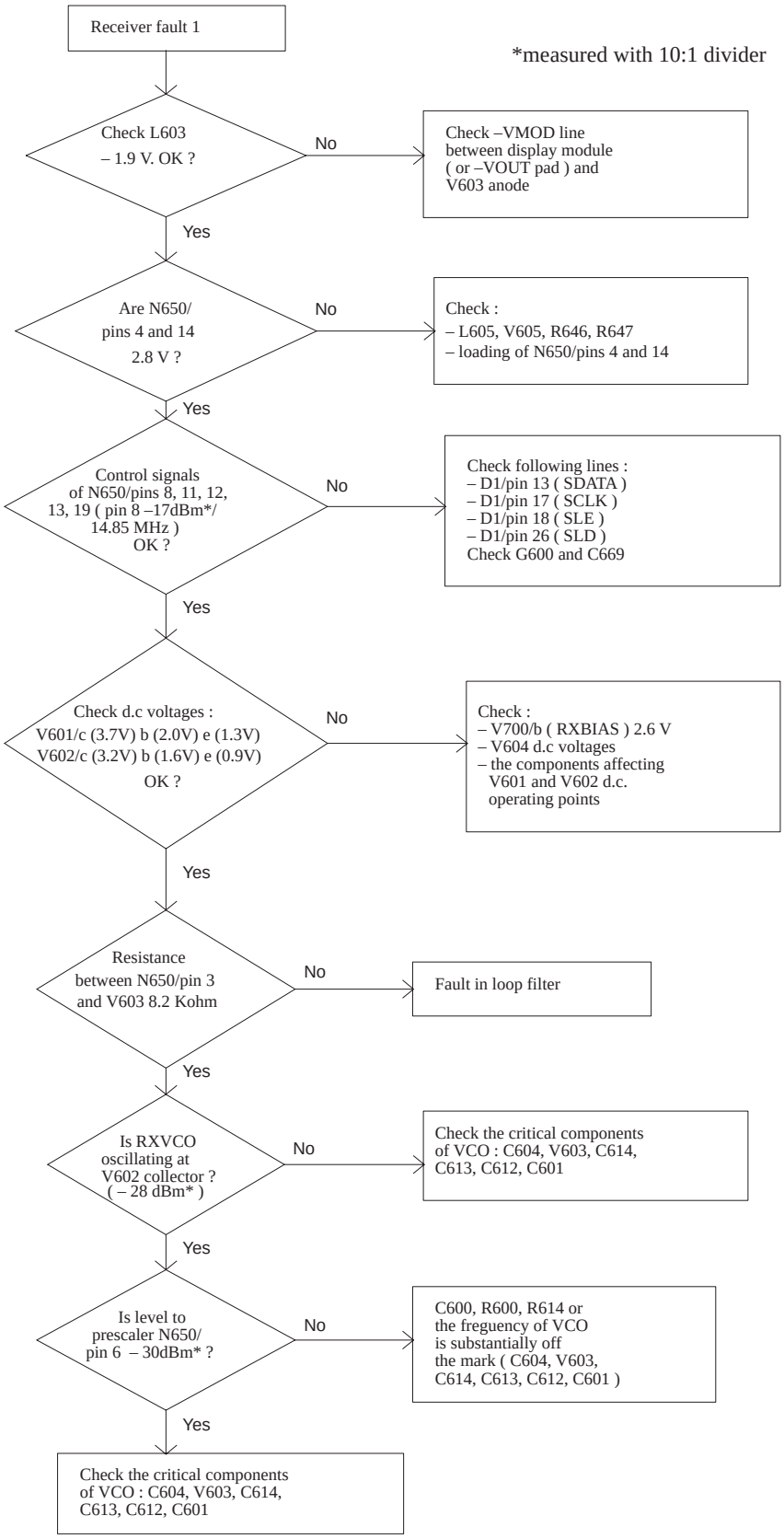

Logic fault
Power drops off or does not assume local mode.
Check clock signal of N2/pin 61 0.8 Vpp/14.85 MHz OK ?
NO
YES
Is RESET 0V in N1/pin 10 ?
NO
YES
Check :
– loading of N1/pin 10
– CRESET N1/pin 20 2.4V
– VCHAR N1/pin 21 0.7 V
Check CLKMCU of N2/pin 63 3.5 Vpp/2.4 MHz OK ?
NO
YES
Check :
– loading of CLKMCU line
– solderings of N2
– if OK, change N2
Check :
– D1/ VA, VL, GND, data and adress lines
– N1/pin 11 TXD 3.3 V
– N1/pin 12 3.3 V
– loading of RXD line
– loading of MBUS line
– if OK, change D1
Are VL (N1/pin 23) and VA (N1/pin 2) 3.3 V ?
NO
YES
Check :
– COFF N1/pin 16 2 Vpp
– VBAT N1/pins 1, 5 and 22 4.8 V
– GND N1/pins 7, 19 and 24
– CREF N1/pin 6 3.3 V
– if OK, change N1
Is G600 / VCC 3.6 V ?
NO
YES
Check :
– loading of VRXI–line
– R717 and R718
– VREF–line
– the components affecting V901 and V902 d.c. operating points
Check:
– solderings of G600
– loading of CLKIN–line
– C77
– if OK, change G600

Receiver Fault 1

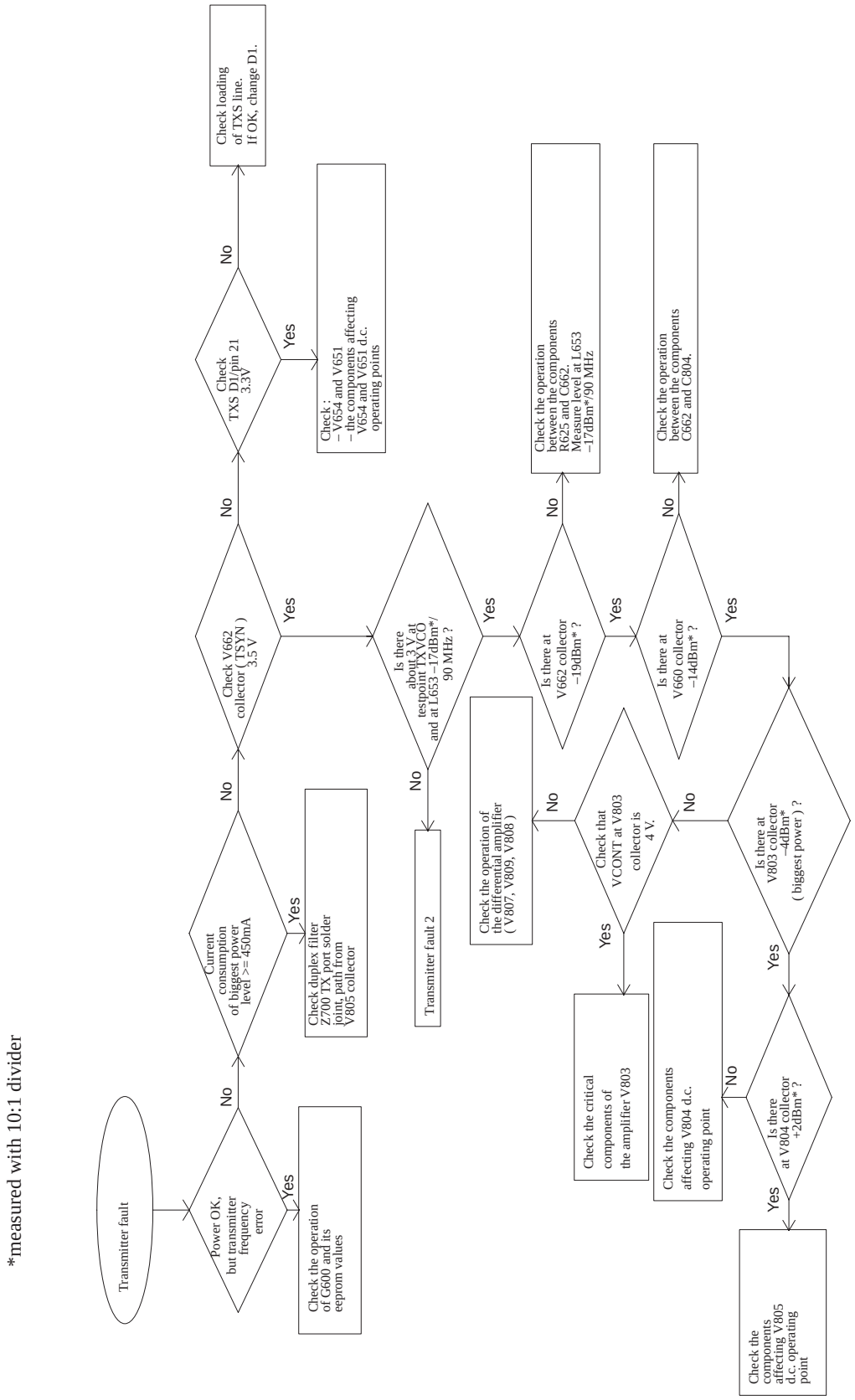

Receiver fault
Simplex sens. (TX off) OK?
TX spectrum OK ?
Replace duplex filter Z700
Transmitter fault
Noise or AF signal at X1/pin 9 XEAR
Receiver fault 2
Test point RXVCO, middle channel 2.5 – 4.0 V
Check solderings of V601, C600, C602 and C709
Injektion level at C709 – 16dBm*
Check solderings of R636, C749, C718, C719 and L710. Check also N700/ pins 1 and 2.
Is there at N700/pin 2 – 28dBm*/ 44.55 MHz ?
Check the operation between the aerial and Z703
Is there level at Z703 – 63dBm* ?
Check solderings of Z703, L706, C706, Z702, V701 and C716
Check level at C706 – 51dBm*/ 45 MHz. OK ?
Check : – the operation between C706 and C705 – V703 d.c. voltages
Is there at C705 – 34dBm*/ 45 MHz ?
Check : – solderings of N700 – 2nd IF line N700/ 3–5–10–11 – N700 d.c. voltages at different pins
AF signal at R716 DAF line
Earphone level fault
Check R702 V700 d.c. operation point
Is (VCC) N700/pin 4 1.65 V
Check IF demodulator circuit L704, C723, R712, R715, C722, C727, solderings of N700, N700/pin 9 and R716
Are VRXI (V700/c) 3.65 V and RXBIAS (V700/b) 2.6 V ?
Is VREF (R906) 3.3V ?
Check : – loading of VREF line – if OK, change N1
Is VRX (C901) 3.7 V ?
Check the components affecting V901 and V902 d.c. operating points
Check : – R717 – loading of RXI line – RXBIAS line
No
Yes

*measured with 10:1 divider

Receiver Fault 2

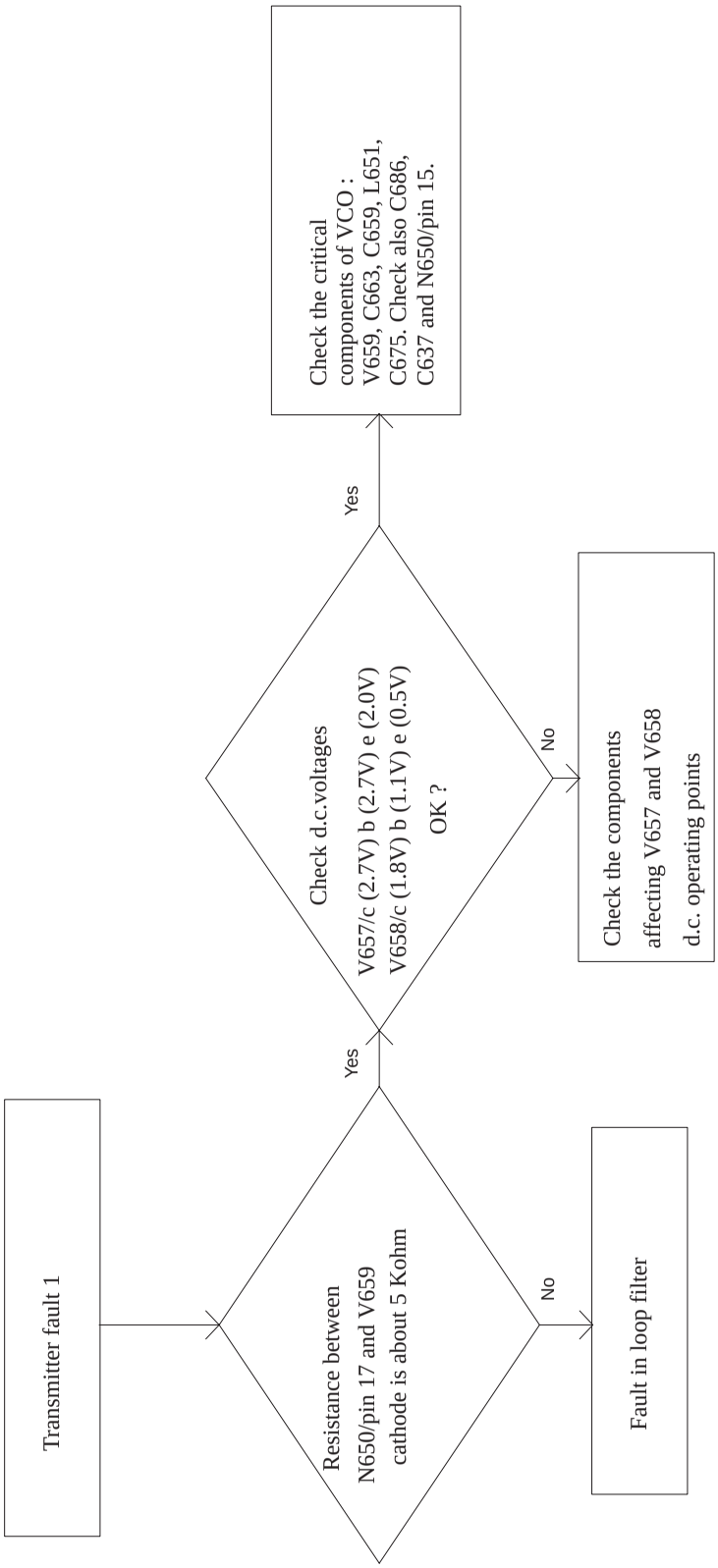

Receiver fault 1
*measured with 10:1 divider
Check L603 – 1.9 V. OK ?
No
Check –VMOD line between display module (or –VOUT pad) and V603 anode
Yes
Are N650/ pins 4 and 14 2.8 V ?
No
Check : – L605, V605, R646, R647 – loading of N650/pins 4 and 14
Yes
Control signals of N650/pins 8, 11, 12, 13, 19 (pin 8 –17dBm*/ 14.85 MHz) OK ?
No
Check following lines : – D1/pin 13 (SDATA) – D1/pin 17 (SCLK) – D1/pin 18 (SLE) – D1/pin 26 (SLD) Check G600 and C669
Yes
Check d.c voltages : V601/c (3.7V) b (2.0V) e (1.3V) V602/c (3.2V) b (1.6V) e (0.9V) OK ?
No
Check : – V700/b (RXBIAS) 2.6 V – V604 d.c voltages – the components affecting V601 and V602 d.c. operating points
Yes
Resistance between N650/pin 3 and V603 8.2 Kohm
No
Fault in loop filter
Yes
Is RXVCO oscillating at V602 collector ? (– 28 dBm*)
No
Check the critical components of VCO : C604, V603, C614, C613, C612, C601
Yes
Is level to prescaler N650/ pin 6 – 30dBm* ?
No
C600, R600, R614 or the freguency of VCO is substantially off the mark (C604, V603, C614, C613, C612, C601)
Yes
Check the critical components of VCO : C604, V603, C614, C613, C612, C601

Transmitter Fault 1

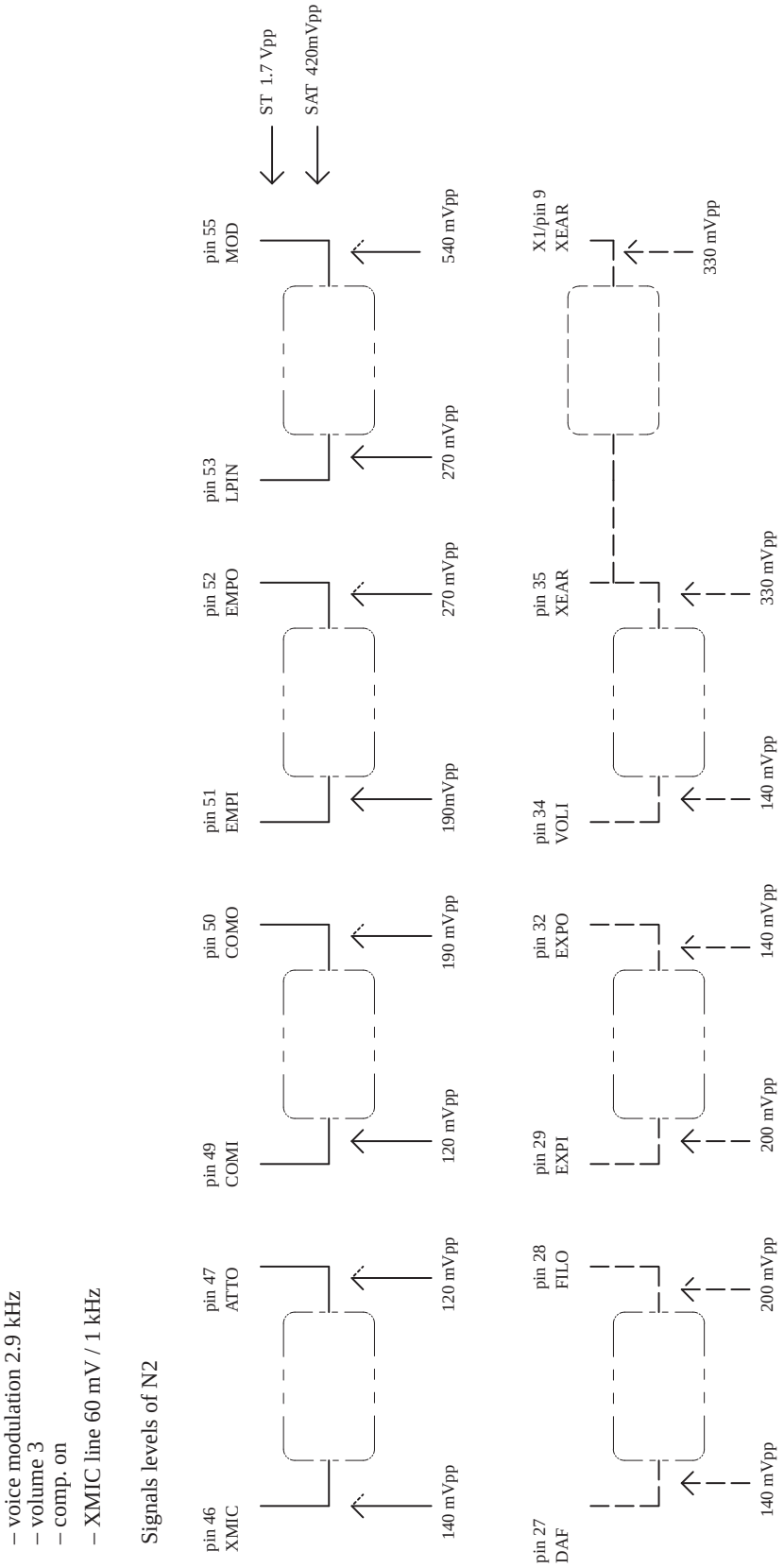

Transmitter fault
Power OK, but transmitter frequency error
Check the operation of G600 and its eeprom values
Current consumption of biggest power level >= 450mA
Check duplex filter Z700 TX port solder joint, path from V805 collector
Check V662 collector (TSYN) 3.5 V
Check TXS D1/pin 21 3.3V
Check loading of TXS line. If OK, change D1.
Check : – V654 and V651 – the components affecting V654 and V651 d.c. operating points
Is there about 3 V at testpoint TXVCO and at L653 –17dBm*/ 90 MHz ?
Transmitter fault 2
Check the operation of the differential amplifier (V807, V809, V808)
Is there at V662 collector –19dBm* ?
Check the operation between the components R625 and C662. Measure level at L653 –17dBm*/90 MHz
Check that VCONT at V803 collector is 4 V.
Check the critical components of the amplifier V803
Is there at V660 collector –14dBm* ?
Check the operation between the components C662 and C804.
Check the components affecting V804 d.c. operating point
Is there at V803 collector –4dBm* (biggest power) ?
Is there at V804 collector +20dBm* ?
Check the components affecting V805 d.c. operating point
Yes
No

*measured with 10:1 divider

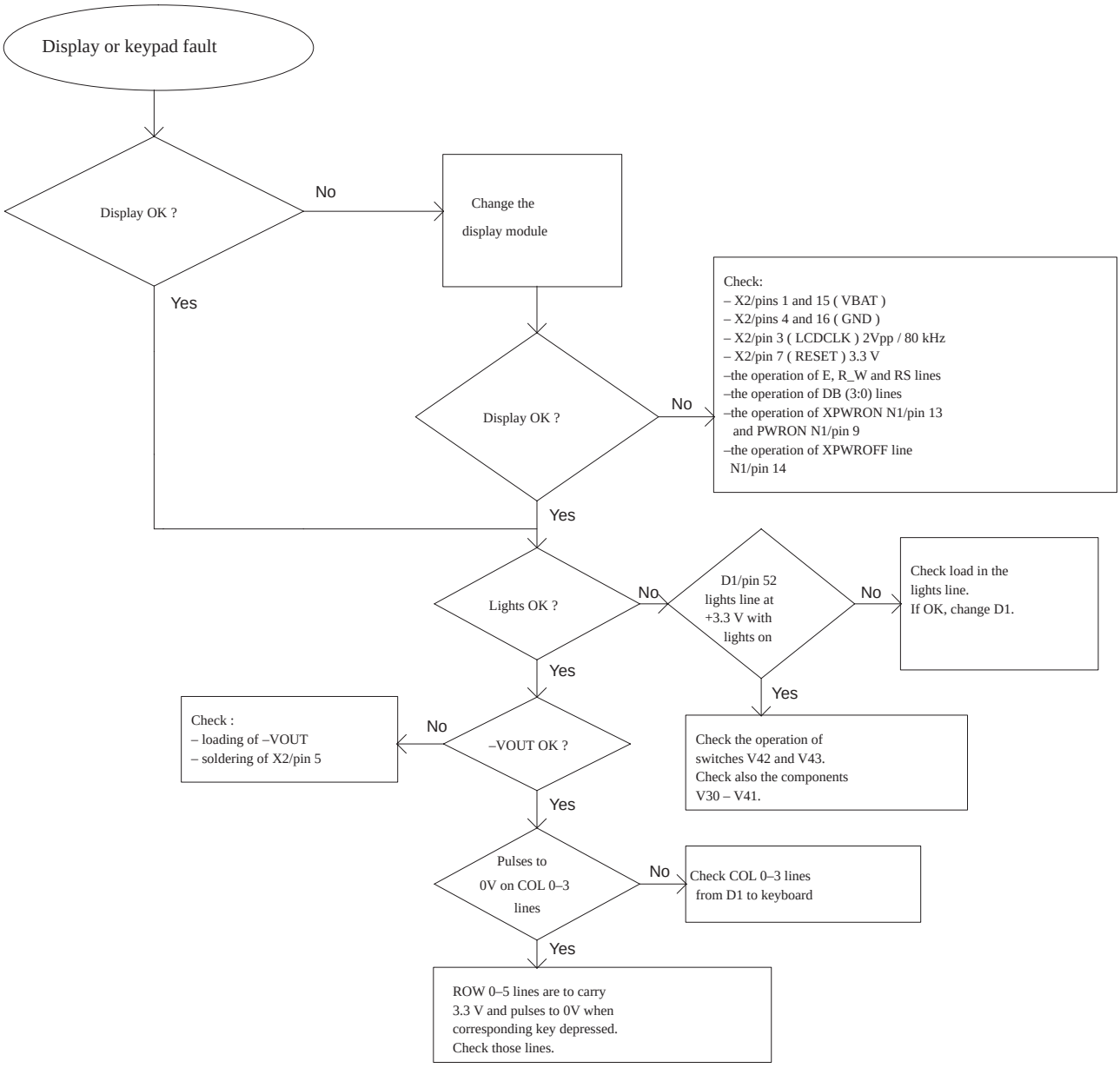
Transmitter Fault 2


Transmitter fault 1
Resistance between N650/pin 17 and V659 cathode is about 5 Kohm
No
Fault in loop filter
Yes
Check d.c.voltages V657/c (2.7V) b (2.7V) e (2.0V) V658/c (1.8V) b (1.1V) e (0.5V) OK ?
No
Check the components affecting V657 and V658 d.c. operating points
Yes
Check the critical components of VCO : V659, C663, C659, L651, C675. Check also C686, C637 and N650/pin 15.

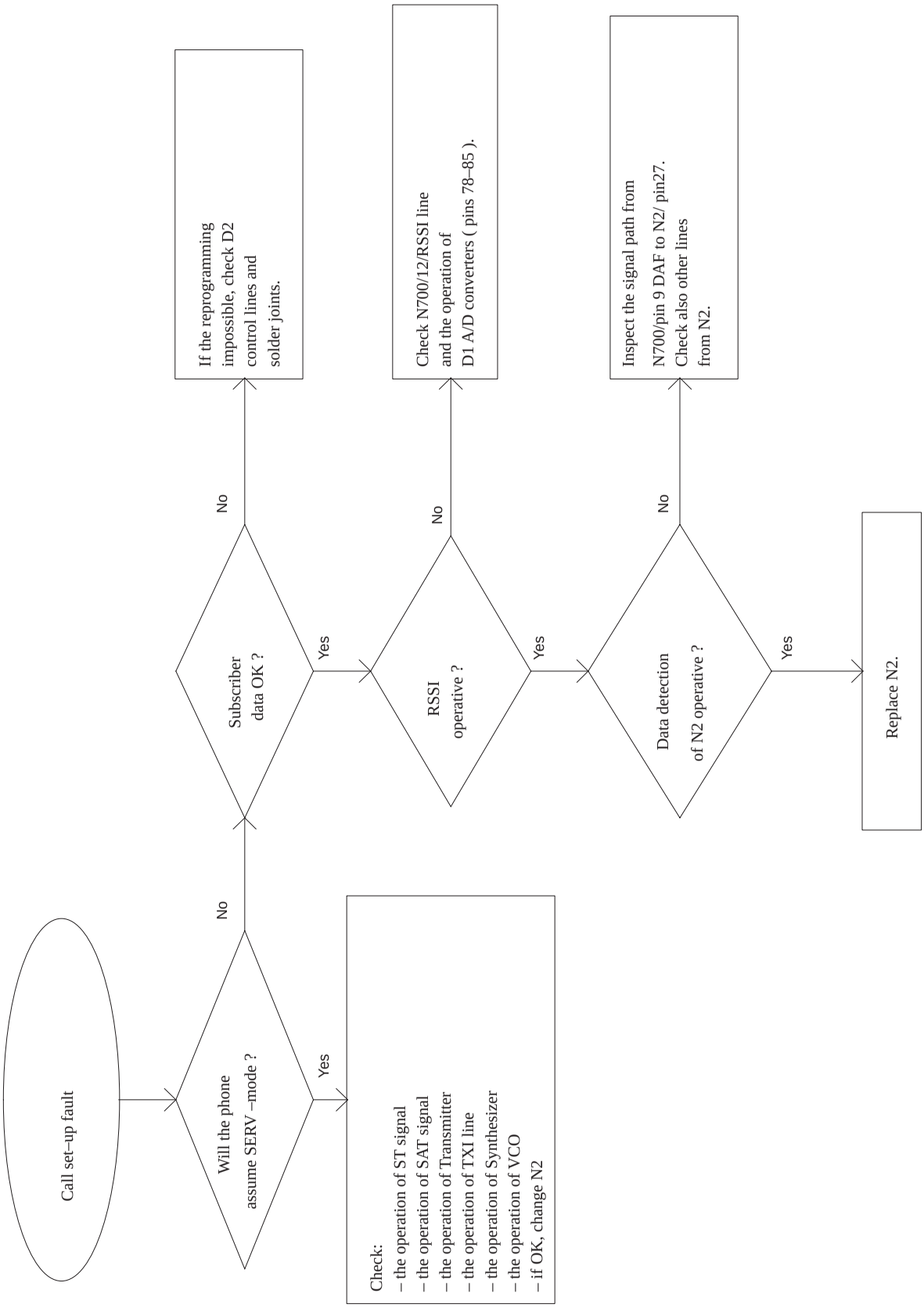
Earphone Level/Modulation Level Fault



Display or Keypad Fault


Display or keypad fault
Display OK ?
No
Change the display module
Yes
Display OK ?
No
Check:
– X2/pins 1 and 15 (VBAT)
– X2/pins 4 and 16 (GND)
– X2/pin 3 (LCDCLK) 2Vpp / 80 kHz
– X2/pin 7 (RESET) 3.3 V
–the operation of E, R_W and RS lines
–the operation of DB (3:0) lines
–the operation of XPWRON N1/pin 13 and PWRON N1/pin 9
–the operation of XPWROFF line N1/pin 14
Yes
Lights OK ?
No
D1/pin 52 lights line at +3.3 V with lights on
No
Check load in the lights line.
If OK, change D1.
Yes
Yes
Check the operation of switches V42 and V43.
Check also the components V30 – V41.
Check :
– loading of –VOUT
– soldering of X2/pin 5
No
–VOUT OK ?
Yes
Pulses to 0V on COL 0–3 lines
No
Check COL 0–3 lines from D1 to keyboard
Yes
ROW 0–5 lines are to carry 3.3 V and pulses to 0V when corresponding key depressed.
Check those lines.

Call Set–up Fault


Call set–up fault
Will the phone assume SERV –mode ?
Yes
No
Check:
– the operation of ST signal
– the operation of SAT signal
– the operation of Transmitter
– the operation of TXI line
– the operation of Synthesizer
– the operation of VCO
– if OK, change N2
Subscriber data OK ?
Yes
No
If the reprogramming impossible, check D2 control lines and solder joints.
RSSI operative ?
Yes
No
Check N700/12/RSSI line and the operation of D1 A/D converters (pins 78–85).
Data detection of N2 operative ?
Yes
No
Inspect the signal path from N700/pin 9 DAF to N2/ pin27. Check also other lines from N2.
Replace N2.

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